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ABSTRACT

The need for colleges to develop critical thinking skills in mainstream courses is emerging as an issue of national significance. Students benefit from clearly articulated and pedagogically sound courses that directly and explicitly teach thinking skills, as well as from efforts to reinforce these abilities across the curriculum. At LaGuardia Community College (LCC) in New York, the thinking skills program began with a course entitled "Critical Thought Skills," which seeks to develop students' writing, reading, and speaking skills; address basic thinking, reasoning, and problem-solving skills; and encourage students to explore their attitudes toward life and education. For the past four years, one section of the course has been paired with other courses selected from a variety of disciplines. The intellectual abilities taught in "Critical Thought Skills" are reinforced as the content of the two courses is integrated. Students enrolled in "Critical Thought Skills" paired with writing and reading courses have developed language skills at accelerated rates, through substantive writing assignments, critical evaluation of challenging readings, and thoughtful discussion. The pedagogical focus of the program stresses the relationship between what students are learning and their own experiences, building systematically from concrete, familiar contexts to more abstract, conceptual understandings. Thinking skills are taught through a process of synthesis, giving students the means to clarify and make sense of themselves and the world in which they live. The final elements in LCC's critical thinking program are faculty development, collaboration, and ownership of the program. (AJL)

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# TEACHING CRITICAL THINKING ACROSS THE CURRICULUM

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LaGuardia Community College

March, 1988

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# TEACHING CRITICAL THINKING ACROSS THE CURRICULUM

Much of higher education is involved in a process of intense soul-searching, seeking to determine its mission and assess the extent to which this mission is being achieved. This reflective analysis has developed out of the growing realization that in many cases the promises made by higher education are not being fulfilled. Traditionally, a higher education has been thought to produce literate and sophisticated thinkers, equipped with the knowledge and intellectual abilities needed to be informed citizens and successes in their chosen careers. Yet in a modern day re-enactment of the fabled Emperor's New Clothes, there is the growing awareness that many students are not leaving college clothed with the intellectual understanding and depth of insight supposedly symbolized by the degrees they have received. This cognitively denuded state of our graduates has stimulated a national dialogue which is focused on improving the intellectual abilities of our students.

The need for higher education to foster the development of these sophisticated thinking abilities in mainstream college courses is emerging as a problem of national significance, as indicated by a recent article in The Chronicle of Higher Education (March 5, 1986) entitled "Many Professors Now Start at the Beginning by Teaching Their Students How to Think." The article reports that an increasing number of faculty can no longer assume that their

students can analyze arguments and reason thoughtfully about issues by the time they reach college. While students are typically able to absorb information, memorize facts and learn fixed procedures, they often experience profound difficulties in thinking critically and creatively about what they are learning. In response, educators are making efforts in a variety of different areas in order to effectively meet these challenges, including the following:

Teaching thinking abilities directly
Teaching thinking in the disciplines
Teaching thinking through language development
Teaching thinking with pedagogy
Teaching thinking to the whole student
Teaching thinking through professional development

Unfortunately, these general initiatives are too often pursued independently of one another. In fact, they are sometimes even set at odds, provoking pseudo-questions like:

Should thinking abilities be taught directly
or in the disciplines?
Is it more important to teach language abilities
or thinking abilities?
Is intellectual development primarily cognitive
or dispositional?

These false and often arbitrary distinctions do not reflect the integrated way our minds are challenged to function in real life situations.

In the remainder of this paper, I would like for us to briefly explore some of the general initiatives designed to foster intellectual growth, with the goal of understanding how we can work to integrate these various areas into a unified approach towards fostering critical thinking and general intellectual

development.

Defining Thinking Skills:

There is a certain commonplaceness to the concept of thinking. After all, practically everyone can do it to some extent; and it is so taken for granted by most people that it is rarely thought of or mentioned in any direct fashion. Yet this commonplace and mundane appearance of "thinking" is deceiving, for when we turn our attention to it in order to discover exactly what it is, we find that it is slippery, amorphous, multifaceted, and extremely difficult to get a handle on. This complex and elusive quality of thinking is reflected in the plethora of definitions of thinking, critical thinking, problem-solving, and so on. However, we should keep in mind the point that our thinking should be served by definitions, not enslaved by them. Rather than arguing over which definitions are "correct," we would better spend our resources by specifying what our definitions mean and then discussing the ideas they embody. For the record, here are my working definitions of "thinking" and "critical thinking."

> Thinking - our active, purposeful, organized efforts to make sense of the world
>
> Thinking Critically - making sense of our world by carefully examining our thinking (and the thinking of others) in order to clarify and improve our understanding

In order to flesh out general definitions like these, we also need to articulate the qualities, dispositions and abilities which constitute these general processes. As with general definitions, there are many lists of specific intellectual

abilities in circulation, developed for varying contexts and ranging from micro levels to macro levels. Here is my listing of the macro level thinking abilities required for challenging college curricula, professional careers and many life experiences.

Solving problems
Generating, testing and organizing ideas
Forming, relating and applying concepts
Designing systematic plans of action
Constructing and evaluating arguments
Exploring issues from multiple perspectives
Reasoning analytically with concepts, relationships and abstract properties
Generalizing and abstracting
Developing evidence to support views
Carefully analyzing ideas and situations
Discussing subjects in an organized way
Applying knowledge to new situations and creating new examples
Becoming aware of one's own thinking process in order to monitor and direct it
Developing a questioning attitude which penetrates beneath the surface of what is being presented
Bringing critical judgment to bear in analyzing the overall logic, importance and validity of information
Using alternate thinking languages (for example, visual thinking) to explore problems and reach solutions
Developing approaches for promoting holistic, intuitive and creative understanding and insight
Relating what is being learned to what is already known in effective and creative ways

As important as it is to clearly identify the abilities we are attempting to develop, any such listing of abilities is of limited usefulness. First of all, thinking skills do not operate in isolation - they act in complex interaction with one another. Thinking is a dynamic process that cannot be factored into sub-skills and then reassembled in Humpty Dumpty fashion. It must be approached holistically, involving challenging activities in which the relations between the various skills remain intact. Secondly, no matter how explicit and comprehensive a list of

skills is, it gives no clue to methods for developing these abilities and teaching them to others.

Teaching Thinking Skills Directly

In a recent commentary appearing in "Education Week" entitled "Why 'Critical Thinking' Programs Won't Work," the educator Mortimer J. Adler argues that recent efforts to teach thinking skills directly are superficial and ineffective. Instead, he argues, teaching students to think should be a prime objective of basic schooling, integrated into the teaching of content courses. Naturally this infusion of thinking across the curriculum is a necessary - and desirable - objective. But there are persuasive reasons for advocating the direct teaching of intellectual abilities. The fact is that thinking abilities are simply not being taught and reinforced sufficiently in college content courses. If they were, there would be no perceived need or impetus to develop these cognitive abilities. Most teachers in the disciplines view their primary responsibility to be "covering' content - not encouraging students to think about and critically evaluate what they are learning. Students benefit from both these efforts - having basic thinking abilities taught directly and explicitly and having these abilities reinforced across the curriculum. Further, the existence of a clearly articulated and pedagogically sound course in thinking skills provides an invaluable resource and model for content faculty to draw from in redesigning their own courses and teaching methodologies.

Of course, care must be taken in designing and teaching thinking skills courses. For example, these skills cannot be taught in isolation - they must be applied to a variety of contexts in order to facilitate transfer of these skills to life situations and academic course work. In addition, the proper intellectual skills must be identified and taught in a way which fosters active lasting learning.

At LaGuardia Community College, the thinking skills program began seven years ago with a course entitled "Critical Thought Skills." "Critical Thought Skills" was developed to help provide students with the basic thinking and literacy abilities needed for academic and career success, and focuses on three general areas. First, it is designed to enhance and accelerate the development of students' writing, reading and speaking skills. It is our assumption--supported by persuasive evidence--that deficiencies in these tracitional skill areas are in part symptoms of more fundamental thinking deficiencies. Second, the course is aimed at addressing basic thinking, reasoning and problem-solving abilities, skills that have been in decline for some time across the nation. Third, the course is constructed to encourage students to explore their basic attitudes towards life and education and to foster the development of qualities like initiative, maturity and responsibility. We currently offer thirty-five sections of the course each year taken by seven hundred students. The course is interdisciplinary, taught by faculty from a variety of subject areas, and is designed to provide a foundation of fundamental abilities and attitudes.

Since the course is an elective, its growth can be seen as one indication that faculty, administrators and students believe it is a valuable addition to the curriculum. A typical student evaluation of the course is expressed in the following statement:

> The words 'critical thinking' will never leave my vocabulary, because by learning how to think critically, I am learning how to organize my ideas, support my points of view with reasons and trying to solve my problems rationally. I have learned more effective ways of dealing with my life, my children and my school work."

Teaching Thinking in the Disciplines

There has been an increasing trend in colleges and universities to view education as the transfer of information from teacher to student, rather than developing a progressive understanding of how each discipline generates and "thinks" about information - the concepts and methodologies it uses to organize and structure its area of inquiry. This information - transfer perspective as been described in various ways, ranging from the high-tech 'data-bank' theory of education to the more earthy 'feedlot' model of learning, a perspective embodied in faculty's recurrent concern about "covering" enough material (an apt metaphor). This cognitively passive analysis of learning is reflected in the following quote by a contemporary thinker contrasting the learning of history to the development of thinking and reasoning abilities: "When you learn history, you acquire a number of facts, causes, explanations and theories. That is mastering history."

Such a view obscures the fact that every discipline is a "thinking" activity, a structure of concepts, vocabulary and methodologies used to organize experience, approach problems and give explanations. From this perspective, instead of simply presenting students with the facts and theories of history, the role of faculty is to introduce students to the way a historian thinks about and perceives the world, a perspective which leads to the construction of historical information and analysis of the past. This view of education is consistent with the modern historian who said "If you can memorize it, it isn't history," and with Albert Einstein's observation that "Education is what remains after you have forgotten all the facts you learned." Our primary goal as educators is to foster the development and comprehension of those critical intellectual abilities and ways of thinking which constitute the structure of our disciplines and the soul of inquiry in general.

At LaGuardia, our efforts to accomplish this goal of infusing critical thinking across the curriculum have been funded by four years of support from The National Endowment for the Humanities. The project is structured around teaching "pairs," in which a section of Critical Thought Skills is joined with another course selected from a variety of academic areas. Students enrolled in a Critical Thought Skills course pairing have to take both courses, providing a vehicle for integrating the courses and reinforcing the fundamental intellectual abilities embodied in the Critical Thought Skills course. These course pairings, working in concert with weekly faculty meetings, enable

participating faculty to work closely together in articulating their course structures and reinforcing fundamental thinking abilities, basic operating concepts and pedagogical methodologies. The project thus gives faculty the opportunity and guidance to redesign their courses and refine their teaching methodology with the aim of fostering critical and creative intellectual abilities, thus enhancing students' opportunities to achieve their academic and career aspirations. The program has been subject to ongoing evaluation, characterized by one evaluator as "A mature educational program which has been tried and succeeded with a wide spectrum of students," and evaluated by NEH as "a very enlightened approach to undergraduate instruction." Faculty participants state that the project has fostered the development of thinking abilities at both general and specific levels. The evaluator for the project, (Dr. Garlie A. Forehand, Director of Research, Program Planning and Development, Educational Testing Service) reports:

> At the general level, teachers perceive more respect for the thinking process, more tendency to bring a "habit of thinking" to their classes. (One teacher overheard a student saying of Critical Thought Skills: 'I get so tired of thinking in that class') At the specific level, teachers reported instances of transfer of such skills as breaking problems into parts, classifying, organization of thought, asking questions, separating facts from opinions, and assessing alternative points of view."

Students also recognized the transfer of thinking skills from Critical Thought Skills to the content courses, citing examples like breaking problems into parts in math; applying the concepts of perceiving to the concept of ethnocentrism in social science; transferring self-perception insights to oral communication.

A detailed analysis of the development and transfer of thinking skills is located in the Final Report of the NEH project, available by writing to the author.

Teaching Thinking Through Language

The development of our thinking abilities is closely tied to the development of our language abilities - and vice versa. This is due to the interwoven and reciprocal relations between thinking and language. When we write or speak, we are using language to express our thinking, and when we read, we are actively using our minds to comprehend the thinking of others. At the same time, the process of using language generates ideas, and the language we (or others) use, shapes and influences our thinking. In using our thinking capacities to make sense of the world, we are actively composing it, and language is the main tool for accomplishing this end. At almost any given moment we are engaged in active thinking/language operations like organizing, naming, defining, classifying, articulating relationships, problem-solving, inferring, deducing, judging, predicting, hypothesizing, conceptualizing, exemplifying, generalizing, and so on. The implications for the classroom are clear: we have to teach language skills in order to teach thinking skills effectively, and we have to teach thinking skills in order to teach language skills effectively.

One of the overall goals of a college education has always been to give students the opportunity to become articulate and literate thinkers, writers, speakers and readers. What is

distressing in reviewing typical college courses and textbooks is how little thinking, writing, reading and speaking students are expected to do. Many of their examinations are multiple-choice, true-false, or short answer, giving students little opportunity to express their thinking in any systematic or developed fashion. Much of the reading they are required to do has as its main goal the transfer of information, not the critical evaluation of the ideas being presented. And many classes are cast primarily in a lecture format, reinforcing the notion that students are passive receptacles into which information is poured, not thinkers who can question, reflect and exchange ideas with others.

In contrast, the Critical Thinking Skills program at LaGuardia is based on the conviction that substantive writing assignments, critical evaluation of challenging readings, and thoughtful discussion are key ingredients in the effective teaching of thinking skills. As a result of this approach, students enrolled in Critical Thought Skills courses paired with writing and reading courses have developed these skills at accelerated rates, nearly doubling the school-wide average on standaradized examinations. The evaluator of the project sums up:

> Of course, the intended value of Critical Thought Skills instruction is not limited to improved passing rates in reading and writing courses. It is expected that students will learn to think more critically, apply these developing skills to their own lives, and use them to improve performance throughout college study. The positive results in writing and reading increase the plausibility of expectations for broader effectiveness.

Critical Thinking with Pedagogy

As with most complex abilities, we learn to think not by reading about thinking, nor by talking about thinking, not even by observing the thinking of others. Instead, we learn to think by actually having opportunities to actively think ourselves. Thus, the goal of a course in thinking is not so much to transfer information about thinking but to provide structured opportunities which stimulate and guide students to actively think for themselves--to wrestle, to grapple, to work through thinking situations on their own and in the group. In addition, developing thinking abilities involves not only doing it, but critically reflecting on our thinking - thinking about our thinking - in order to understand the process and then sharpen, clarify and refine it.

These pedagogical principles apply to all disciplines - active learning lies at the heart of effective, lasting education. Strategies which stimulate an active discovery approach to learning include interactive teaching which encourages student questioning and participation; collaborative group work based on peer analysis and evaluation; student led discussions which explore key concepts dialogically; writing activities and other projects that encourage students to read with a questioning attitude and to analyze the subject matter systematically; projects that stimulate students to use the knowledge they are gaining to develop and test hypotheses, generalize to new situations, and evaluate the reasoning being presented; having students articulate their thinking and receive feedback in order

to encourage awareness of their cognitive processes and to develop the metacognitive skills of self-monitoring and self-direction.

Effective learning also involves relating what students are learning to their own experience, building systematically from their concrete, familiar contexts to more abstract, conceptual understandings. One of the key insights of modern cognitive psychology is the fact that we create explanations and solve problems in ways that are consistent with our ways of thinking, with the manner in which we organize experience.

We learn by gradually expanding our frame of reference, building on what we know by integrating new information into our framework of meaning. From this perspective, the goal of education involves bringing together the structure and content of our disciplines with the experience of our students. For effective learning to take place, students must have the opportunity to explore and discover for themselves, to apply what they are learning to their lives. Once students have internalized the fundamental concepts, skills, methodologies, and insights of our disciplines, we can gradually build to less personal and more abstract areas of inquiry. However, if we merely try to transfer our knowledge and insights, oblivious to the students' contexts and ways of thinking, then much of their learning will be rote, memorizing key facts and learning to manipulate bits of information that have no real meaning to them.

For example, consicer the project of trying to teach someone the skills of effective problem-solving. My initial classroom efforts were typical of approaches in this field--namely, presenting students with problem situations and then trying to show them strategies for systematically analyzing these situations. The results of this approach were less than satisfactory becasuse the methodologies remained external to the students' experience. At this point, I decided to ground the problem-solving methodologies in their experience by having them analyze problems drawn from their own lives. I discovered that by working through problems that are meaningful to them, students tend to internalize the problem-solving methodology that is being developed. Once internalized, this way of thinking becomes an ongoing part of the way that they make sense of the world, thus erasing the line between the classroom and their lives. Additionally, once students integrate a problem-solving methodology into their way of making sense of the world, they can then progress to analyzing problems that are less personalized and more abstract--for example, how to write a composition, solve an equation, write a computer program, or design an experiment. This strategy of developing concepts and methodologies by first rooting them in the students' experience and then moving progressively to more abstract applications became an important part of the pedagogical model upon which the "Critical Thought Skills" course is based.

Teaching Thinking To the Whole Student

In recent years there is growing recognition that effective

education must address the whole student: the writer, not just the writing; the thinker, not just the thoughts. In order for students to develop the self-insight and motivation required for meaningful intellectual development, they must be encouraged to relate what they are experiencing to their lives--to their goals, their values, their self-concepts.

The Harvard educator William Perry has provided an articulate analysis of students' personal and intellectual growth. He distinguishes a number of "stages" which students pass through--coherent interpretive frameworks through which students give meaning to their educational experience. Students revise these ways of organizing experience and understanding education in an orderly sequence from the relatively simple to the more complex. Thus this odyssey begins in what he terms the "Garden of Eden" in which the instructor is perceived as absolute authority, the source of truth and arbiter of correct answers. The journey continues through a relativistic phase of uncertainty in which all views are considered equally valid, and culminates with what we might term a "critical epistemology." In this stage, knowledge is seen as contextual, not absolute. Some ways of viewing the world are superior to others, but evaluation judgments are always made within a context and must be properly supported by appropriate reasons and evidence. From this vantage point, knowledge is seen as a human construction, an ongoing process of exploration and discovery which involves personal commitment and responsibility.

Teaching the whole student thus involves knitting together thinking abilities with the fabric of students' experience, pursuing the expectation that the abilities students learn in this fashion will become a part of who they are--how they perceive their world, how they experience themselves and others, and how they understand the contexts within which their choices and decisions are made. This view is based on the conviction that thinking skills are best taught through a process of synthesis, giving students the means to clarify and make sense of themselves and the world in which they live.

These insights are illustrated in the following passage written by Dr. Gilbert Muller at LaGuardia, which describes the experience of a student enrolled in a Basic Writing/Critical Thought Skills course pairing:

> Typical of these individuals was Diego, a young man thoroughly confused about life and congenitally innocent of academic experience. Diego had been placed on three years' probation for robbery prior to coming to LaGuardia. For him, the classroom was at the outset as much a refuge from the world as a place in which to learn. Yet at an early point--perhaps during the second week when he analyzed critical and uncritical thinking in an essay that dealt with the period when he and other gang members were robbing delivery boys of their Chinese food and money--Diego discovered that ideas <u>are</u> important. Ideas and the self exist in the world; both must be tested and evaluated; both demand scrutiny. Responsible thinking and action must be achieved if we are to lead authentic lives. Diego's essay on his failure to think correctly and critically was not a passing paper by the standards set by the exit exam committee. But it was a "transformational" paper in terms of self-discovery and Diego's commitment to work energetically and competently to pass the course. Spending more time in the Writing Center than any other class member, Diego moved in ten weeks' time from a state of functional illiteracy to one of relative fluency.

Teaching Thinking Through Professional Development

In the final analysis, students cannot rise any higher than the people who are there to teach and inspire them. In order for students to develop their critical and creative thinking abilities, they must be taught by faculty who are themselves critical and creative thinkers, who embody and stimulate these qualities in every phase of their teaching.

What is the best way to stimulate the professional development of faculty who are entrenched in very traditional modes of thinking and teaching? To begin with, it is clear that we must purusue an organic model of professional growth in which faculty are active, creative participants in the process. Any attempt to externally apply rigid models or use a cookbook of thinking strategies will have little real impact on faculties' teaching or students' learning. The exact strategy for drawing faculty into a critical analysis of their teaching depends on the specific context, but there are key factors relevant to the success of such efforts, including the following:

(1) A curriculum: The meaningful infusion of thinking abilities requires a curriculum structure as the centerpiece. Such a structure makes explicit the core of concepts and abilities which are to be taught, integrated and reinforced. It acts as a point of reference, a focus for collaboration, a benchmark for self-evaluation, and a vehicle for communication. Projects lacking such a structure tend to collapse into chaos and confusion. In the Critical Thought Skills program at LaGuardia, my evolving

text, Thinking Critically, served as the unifying structure, implemented through the course pairings described earlier. At the same time, the perspective embodied in the text was enriched and expanded by the faculty participating in the project.

(2) Faculty Collaboration: Faculty in such projects must have the opportunity to build collaboration through regular meetings, a collaboration based on sharing and critically examining their teaching experiences and reflecting on the process they are engaged in. This sense of sharing intellectual tasks, providing mutual support, and seeing the success of one's efforts all contribute to experiences which are personally and professionlly rewarding. At LaGuardia, faculty who were involved in the project met weekly, developed ongoing materials which reflected the implementation of their ideas, and concluded the experience with an analytical report which examined and evaluated their experience. As the educator Ernest Boyer observes, such collaborative opportunities occur all too infrequently:

> An important part of the working condition that enables one to expand his or her own thinking is learning in "seminar" fashion under careful scrutiny of peers. The working conditions in colleges deny the very encounters that allow teachers to test what they believe and to examine some of their own tentative judgments about various teaching approaches ."

(3) Faculty Ownership: It should be clear at the outset that the goal of such projects is for faculty to absorb a perspective on teaching and learning and then to translate this perspective into their teaching in creative ways. In short, we are asking them to "think critically" as they reconceptualize the structure

of their courses and enhance their teaching methodologies. For example, in the LaGuardia program, faculty from the same subject areas were able to reshape the same course in individually innovative--yet equally valid--ways which reflected each person's unique talents and creative ideas.

Conclusion

One of H. L. Mencken's insightful remarks was the observation: "To every complex question, there's a simple answer-and it's wrong!" We educators who are committed to fostering critical thinking and intellectual development probably recognize as well as any the depth and complexity of the challenges confronting higher education. There are indeed no easy answers to these difficult questions, but this doesn't mean that there are no answers at all. Instead, we might well endorse a reworked version of H. L. Mencken's perception along the lines of "For complex questions there are complex answers--and these are worth pursuing."

By seeking to foster the meaningful development of our students' intellectual abilities, we are seeking to equip them with the tools they will need to construct a stairway to their dreams. It is difficult to conceive of a more worthy educational enterprise.



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